# Buildings for the 21st Century

Winter 2000 | News You Can Use

Office of Building Technology, State and Community Programs

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The White House is also "green," reducing greenhouse gases and energy costs with the use of ENERGY STAR® products.

## EnergySmart Kids Unite

More than 1,000 kids participated in a student essay contest last fall through the EnergySmart Schools initiative, part of the Rebuild America program. Many of them had some very insightful, energy-saving ideas.

"If we don't save energy, we will run out of the easy-to-find energy and will have to get hard-to-find energy," observed Florida fourth-grader Michael Garcia.

"So many people today use energy instead of human power," said Wisconsin sixth-grader Jackie Reilly. "Then, they buy exercise equipment because they are out of shape. Isn't that weird?"

BTS teamed with Owens Corning to create not only the contest but also a four-day educational program for fourth through sixth-grade students. Nearly 15,000 teachers received lesson plans and in-class activities, plus a home energy quiz that involved parents in learning about energy conservation. Students were then invited to write essays for the contest on the subject, "Saving Energy Starts With Me."

The top 12 essay writers—dubbed EnergySmart Schools Ambassadors—each received a $250 savings bond and met last November in Washington, DC, for a summit with DOE Assistant Secretary Dan Reicher and Owens Corning Senior Vice President Bob Lonergan. Working in a conference room beneath the capitol dome, they applied their talents to another writing project: a proclamation aimed at the nation's superintendents.

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Rebuild America helps communities save money and create economic growth through energy-efficient building projects.

The students unveiled their proclamation the next morning during a press conference at one of Washington, DC's, oldest schools, Patterson Elementary. As the other students signed it, New York sixth-grader Robert Niles urged students and parents nationwide to sign the proclamation online at the EnergySmart Schools Web site, *www.eren.doe.gov/energysmartschools/*. "Saving energy starts with you *and* me," Niles reminded the crowd.

### Proclamation

To: School Superintendents

From: EnergySmart Ambassadors*

We must do more to improve the use of energy in our schools. We encourage you to take action that will save energy and protect the environment.

EnergySmart Schools

**In Education**

Teach us about how we use energy and how it affects the environment. Teach us how saving energy and using renewable energy sources can help our school save money and improve our education. Help us form clubs at school that can find ways to save energy, both at school and at home.

**In Transportation**

Use buses that use cleaner fuels and less energy, and look for ways to encourage car pooling.

**In Buildings**

Make sure our new schools are energy-efficient and use renewable energy for lighting and heating. Help repair our heaters and air conditioners to make our schools more comfortable and better places to learn.

**In Maintenance & Operations**

Make sure we turn off lights and other equipment when we're not in school. Buy energy-efficient lights and equipment when we replace things.

Thank you for helping to improve our schools and save our planet.

**The authors of the proclamation were the following fourth through sixth-grade, EnergySmart Schools essay contest winners: Christina Banks, McKenzie Crowther, Michael Garcia, Jia Harden, Elizabeth Keating, Marie Kenney, Aaron McGalliard, Matt McGowen, Sara Moody, Clay Murrell, Robert Niles and Jackie Reilly.*

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Both the National Solar Home Tour and the Buildings for the 21st Century Tour reflect the growing interest in energy-efficient homes among consumers.

### *Energy-Saving Ideas from the Kids*

Keen insights were plentiful among the winners of the EnergySmart Schools student essay contest. Here are a few winning examples:

*I want to start an Energy Watch in my community. We can go door-to-door twice a week looking for wasted energy.* Jia Harden, Patterson Elementary School, Washington, DC

*My eyes focus on the thermostat. I start toward the dial. Wait! I hear the chant of the Heat Busters. Bad girl, bad girl whatcha gonna do? Whatcha gonna do when it beckons you?* McKenzie Crowther, LaJara Elementary School in Antonito, Colorado

*I am kind of worried about pollution...I am going to get an E-bike. I will ride that and recharge it where I go while I am there.* Clay Murrell, Bellevue Sante-Fe Charter School in Shell Beach, California

*When going on trips like to the store, I do several errands to save even more. I know I am small, but when it comes to saving energy, I am really tall!* Sara Moody, home-schooled in Glendale, Arizona

*...kids could peddle a bike which is used to charge batteries—like a power source to run different things in our classrooms....a fish tank ... computers....cold or heat in the rooms. School is maybe seven hours long. That is 420 minutes, so if 210 kids each peddle for two minutes today, the job is done.* Christina Banks, Keswick Christian School in St. Petersburg, Florida.

# DOE, FEMA to Protect Low-Income Households, Environment

A new partnership between DOE's Office of Energy Efficiency and Renewable Energy (EERE) and the Federal Emergency Management Agency (FEMA) will complement the mission of the Weatherization Assistance Program by helping low-income families better prepare for disasters and recover when disaster strikes. An interagency agreement between EERE and FEMA, signed Dec. 15, 1999, at the *Project Impact: Building Disaster Resistant Communities Second Annual Summit,* will make it possible for the more than 950 local agencies that provide weatherization services to low-income households throughout the U.S. to also participate in disaster mitigation. The agencies, mostly nonprofits, already have strong ties to their local communities. The skills they have developed over the past 20 years in providing weatherization assistance will serve their low-income clients well in preparing for disasters.

The interagency agreement links the goals of FEMA's Project Impact and EERE's Weatherization Assistance Program, respectively: 1) to take action in advance to prevent the potentially devastating effects of natural disasters, and 2) to reduce energy costs for low-income families.

Examples of how the agreement could benefit low-income households abound. For instance, in flood-prone areas, heating and cooling systems are best located aboveground or on upper floors. Weatherization crews now upgrade heating and cooling systems for their low-income clients, emphasizing energy savings and home safety. The addition of disaster mitigation measures, such as moving systems out of harm's way, is a natural extension of services already provided to low-income clients.

In early December, representatives of FEMA, the North Carolina Department of Commerce, and the Weatherization Assistance Program met to discuss ways to combine existing weatherization services with disaster mitigation measures. They outlined an approach that includes:

- Identifying areas where disasters are likely to occur
- Informing clients living in disaster-prone areas about hazards
- Identifying mitigation measures that are cost-effective
- Helping clients implement mitigation measures in their homes.

DOE's agreement with FEMA fits in with one of the goals of Weatherization Plus, encouraging local weatherization agencies to add value to their existing low-income weatherization work in their communities. The nationwide network of weatherization providers collaborated with DOE to develop Weatherization Plus, which expands the scope of the weatherization program. The expanded scope is designed to achieve greater energy savings, further reduce harmful emissions, leverage resources through the weatherization network and expand the program's contribution to the nation's economic health and sustainability.

The agreement also supports the Partnership For Advancing Technology in Housing's goals and objectives.

For more information, contact Joe Konrade at 202-586-8039.

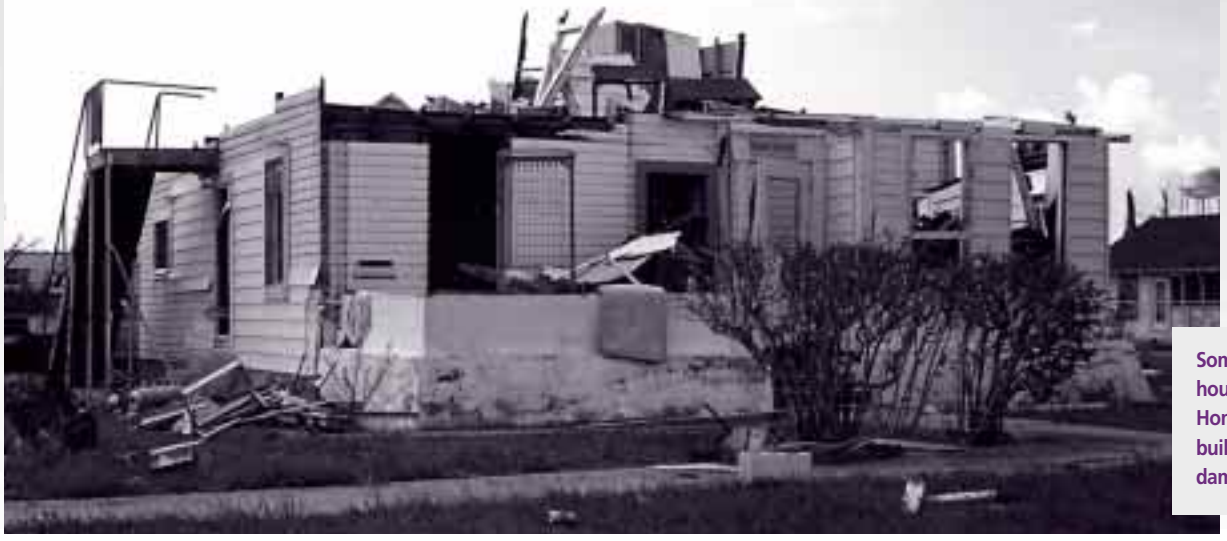


Photo courtesy of Dewberry & Davis, LLC

**Some simple and inexpensive measures can help secure a house against many disasters. For example, if this home in Homestead, Florida, had its roof properly secured to the building frame, it may not have suffered such extensive damage during Hurricane Andrew in 1992.**

# The Greening of the White House: ENERGY STAR® at Work

On Dec. 2, 1999, Secretary of Energy Bill Richardson and Environmental Protection Agency Administrator Carol Browner announced the impressive results of the Greening of the White House—a six-year-long initiative undertaken by the Clinton Administration to improve the energy efficiency and environmental stewardship of the White House complex. The initiative, which focuses on the use of ENERGY STAR® products, has saved taxpayers $1.4 million in energy costs since 1993 and has reduced greenhouse gas emissions by almost 845 metric tons, the equivalent of removing 648 cars from the road for one year.

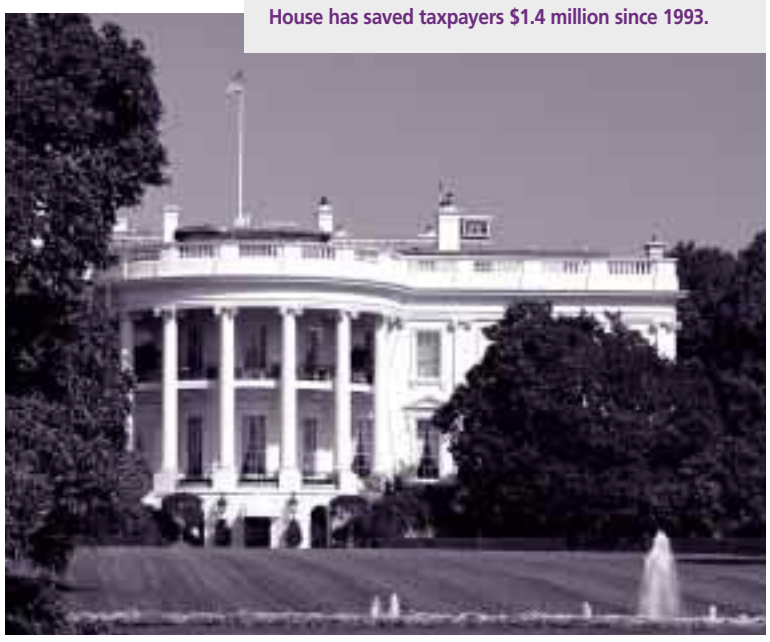
Richardson encouraged consumers to follow the White House's lead and look for the ENERGY STAR® label. Top executives from ENERGY STAR® partner companies—Sears, The Home Depot, Philips Lighting, Maytag and Whirlpool—announced their own corporate initiatives to bring more ENERGY STAR®-qualified products to consumers nationwide.

Also, White House Chief of Staff John Podesta and home improvement expert Bob Vila conducted a tour of the White House, which was broadcast on CBS's "The Early Show." The tour featured many ENERGY STAR® products, from lighting fixtures to office equipment, used at the White House. For instance, the historic cove in the Oval Office now uses fluorescent lighting rather than incandescent light bulbs.

The tour showed homeowners that they can make the same changes with the same results. As Podesta said during the tour, "If you look for an ENERGY STAR® label on a washer/dryer, refrigerator, TV set or on your computer, you can help save yourself some money in the long run, and you can obviously help save the environment."

A full report on the Greening of the White House is available on the Federal Energy Management Program Web site at *www.eren.doe.gov/femp/* or by calling 1-800-DOE-3732. For more information on ENERGY STAR®, visit its Web site at *www.energystar.gov/*.

**The use of ENERGY STAR® products at the White House has saved taxpayers $1.4 million since 1993.**



# New Duct Sealants Promise Energy Savings

DOE, the U.S. Department of Housing and Urban Development, and the Partnership for Advancing Technology in Housing (PATH) will collaborate on a $200,000 field test, which could lead to a dramatic reduction in home heating and cooling bills.

"As much as 30 percent of a home's heating and cooling energy is lost through leaky ductwork, costing consumers nationwide about $5 billion a year," said Secretary of Energy Bill Richardson. "This project is a prime example of how the federal government can help American consumers save money and energy."

Under the project, local weatherization agencies in different regions of the country will test several duct-sealing technologies in about 100 low-income homes this winter. They will monitor heating energy use and measure the amount of savings from the different technologies before and after the ducts are sealed. Substantial energy savings are expected.

If the savings prove cost-effective, DOE will help make the advanced duct sealing technology available to low-income consumers through its Weatherization Assistance Program. The use of advanced technologies is a key element of the Weatherization Plus strategy for expanding the program's scope and benefits.

HUD is providing $200,000 for this project under the PATH program. PATH, a partnership among members of the home building industry and all federal agencies dealing with housing issues, is speeding the creation and widespread use of advanced technologies to radically improve the quality, durability, safety, energy efficiency and affordability of the nation's homes. By 2010, PATH intends to cut energy use by 30 percent in 15 million existing homes and by 50 percent in new housing. For more information on PATH, visit its Web site at *www.pathnet.org/*.

## Marquee Program:

# Rebuild America Helps Communities from the Inside-Out

Rebuild America helps communities nationwide meet their needs with a non-prescriptive approach to energy-efficient building projects that saves money, creates jobs, produces economic growth and helps protect the environment. Ultimately, the positive economic impact of reinvesting energy savings back into a community serves to revitalize neighborhoods and business districts, improve school facilities and upgrade public housing.

From North Carolina to New Mexico, Rebuild America's impact is felt in a variety of ways. Rebuild Shelby (North Carolina) revitalized its downtown by making its commercial properties more energy efficient and profitable. These efforts have slashed the vacancy rate in Uptown Shelby buildings from 25 percent to 5 percent. Ted Alexander of the Uptown Shelby Association says using Rebuild America as a resource makes good business sense. "A strong and vital downtown is a major factor in whether or not a business will locate in a certain community...it is a natural for us to promote energy retrofits as a part of building rehabilitation," he said.

Rebuild America's commitment to improving the nation's schools got a boost recently when four Rebuild America Business Partners—FineLite, Prudential Lighting, NORESCO and Watt Stopper—provided pro bono services to retrofit four classrooms at the Rio Grande High School in Albuquerque, New Mexico. Business partner contractors conducted energy audits and installed efficient T-8 linear fluorescent lamps, special lighting controls, dimmable ballasts and daylighting systems.

Rebuild America's flexibility has allowed it to also meet challenges unique to specific communities, such as Native Americans. In September 1999, two Rebuild America representatives descended the Grand Canyon on horseback to visit a Native American Havasupai village. They conducted energy audits on the village's housing stock, Head Start building and community center. It was determined that energy efficiency retrofits and weatherization techniques would help conserve energy and meet basic housing needs. The Havasupai will be trained in weatherization techniques. DOE will help launch the project in a ceremony slated for late spring.

Seniors are a rapidly growing population today in the United States, and many are forced to live in low-income housing. The needs of this audience are great, and Rebuild America has stepped in to help serve them. For example, in Boston, Massachusetts, the Rebuild Boston Energy Initiative has supported energy and water efficiency upgrades totaling $353,300 throughout the Morville House. This elderly housing complex underwent upgrades including weatherstripping of unit doors to corridors and stairs; installation of an effective smoke suppression system; replacement of existing fans with new units; and changes to the schedule and flow of apartment fans. These improvements not only lowered utility costs but are also allowing for more consistent apartment temperatures and a safer living environment.

Photo courtesy of D&R International

**Rebuild America is working with the Havasupai Tribe in Arizona to upgrade its community buildings, which are located near the bottom of the Grand Canyon.**

# Window Shopping for Energy Efficiency

A quality window is also an energy-efficient window. But unlike many name brand appliances, a high performance window doesn't look a whole lot different from its inefficient counterpart. The Efficient Windows Collaborative (EWC), a BTS initiative, helps educate consumers, builders and designers on how to shop for windows and how investing in energy efficiency pays off in comfort, noise reduction, the reduced fading of fabrics and energy savings.

The EWC Web site at *www.energyefficientwindows.org/* provides unbiased and comprehensive information on all aspects of window energy efficiency, including how they work and recommendations for their selection and use. Visitors can select their region and city, and then read about the energy savings of various window products. By December 2000, consumers, builders, and remodelers will also be able to access a database on the Web site that will help them find energy-efficient products in their region. The Web site currently averages about 9,600 visits per month.

To help increase the number of energy-efficient window products on the market, EWC welcomes companies who manufacture or supply fenestration products (windows, doors, skylights and components of these products), as members. EWC members, by their second year of membership, agree to label at least 90 percent of their products with National Fenestration Rating Council labels and to use ENERGY STAR® labels on qualifying products. In return, members are listed on the EWC Web site and other media. They also receive sales force training and a supply of educational and marketing materials.

For more information on EWC, visit its Web site or contact Alecia Ward with the Alliance to Save Energy at award@ase.org or 202-857-0666. Look for ENERGY STAR® windows at *www.energystar.gov/*.

## Lab Highlights:

# NREL's Center for Buildings and Thermal Systems

Credit: Warren Gretz, NREL

**CBTS was instrumental in the design of NREL's Solar Energy Research Facility, which saves $175,000 a year in energy costs.**

The National Renewable Energy Laboratory's Thermal Test Facility is an energy-efficiency showcase that reduces energy costs by 63 percent and houses the energy-efficiency building research of the NREL Center for Buildings and Thermal Systems (CBTS).

CBTS helped design the Thermal Test Facility, under BTS' Commercial Building Program, as part of its High-Performance Building Project. The project has a goal to create buildings that can meet 75 percent or more of their energy needs through a whole-building approach that integrates a combination of passive solar, daylighting and energy efficiency technologies. Project researchers use energy simulation models and monitor building performance to further develop and enhance whole-buildings design and analysis tools.

While the High-Performance Buildings Project focuses on pushing the envelope in energy-efficient design, BTS' Building America program, also coordinated by CBTS staff, strives to incorporate energy efficiency in homes on a large scale. Building America provides energy solutions for production housing, combining the knowledge and resources of industry partners with NREL's technical capabilities to act as a catalyst for change in the home building industry. CBTS staff also work with other labs and the private sector to improve the energy efficiency of older buildings through BTS' Rebuild America.

Center researchers have developed several software programs to help design energy-efficient buildings. Energy-10 helps architects and building designers identify the most cost-effective, energy-saving measures for small commercial and residential buildings. SUNREL is a flexible, hourly building energy simulation program that models the complex mechanisms of heat and mass transfer in buildings. And BESTEST validates and debugs the algorithms used in building energy software.

CBTS assists other BTS researchers in developing codes and standards processes that address barriers to innovative technologies and works with industry to evaluate those standards. For example, their system-testing activities foster photovoltaics use in buildings, improving the linkage of PV systems with building components and systems. The Center also tests and evaluates electrochromic "smart" windows that save energy by controlling heat gains and losses.

In the area of space conditioning technology, CBTS and its industry partners won an R&D 100 award for developing the transpired solar collector, which uses solar energy to preheat outdoor ventilation air as it is drawn into a building, thereby displacing the need for gas or electric heating. Center staff also work with industry to evaluate advanced desiccant cooling and dehumidification systems and components—a non-CFC, energy-efficient space-conditioning technology that could replace many of today's less efficient systems.

The NREL Thermal Test Facility, which houses most of the CBTS labs, is a large-scale research project itself with its active solar, passive solar, daylighting and HVAC test facilities. Researchers monitor the performance of the facility to validate sustainable design strategies while reducing the building's energy consumption. The building won a 1999 Technology Award for its energy efficiency from the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

For more information, visit the CBTS Web site at *www.nrel.gov/buildings_thermal/* or contact Center Director Ron Judkoff at ron_judkoff@nrel.gov.

## 14,000+ Tour Energy-Efficient Homes

Consumer demand for energy-efficient homes is definitely on the rise. More evidence of this interest arose from the success of the following home tours, which both took place in October 1999.

### National Tour of Solar Homes

During the National Tour of Solar Homes, more than 14,000 people visited solar homes across the country in 175 communities in 36 states with nearly 800 homeowners participating. Visitors everywhere saw many applications of solar technology—passive solar, solar hot water and photovoltaics—in urban, suburban, and rural areas, with homes ranging in price from Habitat for Humanity to upscale custom-built homes.

The American Solar Energy Society organized the tour, which was co-sponsored by DOE, BP Solarex, the Interstate Renewable Energy Council, AstroPower, *Home Power Magazine,* the Utility Photovoltaic Group and Innovative Design.

The next tour will take place on Oct. 14, 2000. Visit the ASES Web site at *www.ases.org/* for more information. To participate as a visitor, homeowner, organizer or sponsor, contact ASES at ases@ases.org or 303-443-3130.

### Buildings for the 21st Century Tour

Nearly 800 people attended the Buildings for the 21st Century Tour in Austin, Texas. Visitors on the tour learned practical applications of energy and resource efficiency, regardless of their budgets. The 12 featured homes ranged from over $1 million and 5,000 square feet to very modest projects under 1,200 square feet at about $65,000. A variety of building technologies were highlighted, including Hebel and Rastra block and straw bale construction, integrated concrete forms, and energy-efficient appliances and mechanical systems.

The Austin tour—sponsored by DOE and the Sustainable Living Alliance, along with other community-based sponsors—is the first of many Buildings for the 21st Century tours planned across the country. Currently, a tour is set up for May 2000 in Albuquerque, New Mexico, and another is planned in Charleston, South Carolina. For more information on these tours, contact Mike Myers with the Sustainable Living Alliance at Mt4myers@aol.com or 512-263-2924.

**During Austin's Buildings for the 21st Century tour, many people visited an energy-efficient and healthy home by Taylor and Taylor Architects and Magnum Homes.**

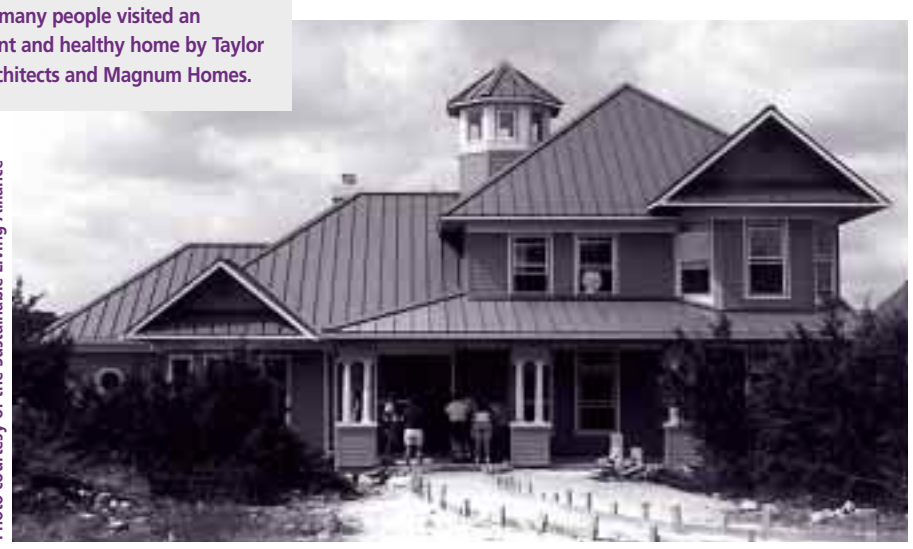


Photo courtesy of the Sustainable Living Alliance

## BTS Meetings, Events & Conference Calendar

| Date | Meeting Event Conference | Contact |
|---|---|---|
| April 3-8 | Affordable Comfort Columbus, OH | Linda Wigington 724-852-3085 Exhibit Info: Joel Fullmer 303-438-6434 |
| April 6-8 | The National Green Building Conference Denver, CO | Michelle Gearen 800-638-8556 www.nahbrc.org/ |
| April 20-22 | Soltech 2000 Washington, DC | Michelle Crespo 301-941-2553 www.seia.org/ |
| April 22 | Earth Day Washington, DC | Exhibit Info: Kim Kendall 202-586-0927 www.earthday.net/ |
| April 25-27 | National Manufactured Housing Congress Las Vegas, NV | Pat Love 423-574-4346 |
| May 4-6 | National Convention and Exposition of American Institute of Architects Philadelphia, PA | AIA 202-626-7396 Exhibit Info: Bill Holliday 617-859-4475 |
| May 8-11 | Light Fair Javits Convention Center New York | Libby Moreley 404-220-2215 |
| May 17-18 | Strategic Energy Forum Rosemont, IL | Exhibit Info: 770-279-4390 www.aeecenter.org/ |
| May 19-20 | Construction Training Show Providence, RI | Larry Rice 802-244-9987 |

## Special Project Funding Available to States

DOE's Office of Energy Efficiency and Renewable Energy (EERE) will award an estimated $14 million this fiscal year to state energy offices for special projects. The state-by-state funding information will be announced in May 2000.

This specialized funding recognizes the important role states play in promoting EERE's national strategies within its program areas, such as building codes and standards, alternative fuels, industrial efficiency, building efficiency and renewable energy technologies. For example, several of the state projects funded last year focused on improving the energy efficiency of school buildings, supporting DOE's EnergySmart Schools initiative.

States, territories and the District of Columbia compete for these special project grants by submitting written proposals to the DOE State Energy Program (SEP), which administers the projects. The special project awards provide funding to state energy offices in addition to the annual formula grants they receive from SEP. States use formula grants to design projects that address their individual energy priorities.

For more information on the special project grants for fiscal year 2000, visit the BTS Web site at *www.eren.doe.gov/buildings/state_energy/*.

**Correction**
*In our last issue, we inadvertently left off the forward-slash at the end of the EnergyPartners Web site address. The correct address is www.eren.doe.gov/buildings/energypartners/. We apologize for any inconvenience this may have caused.*


## Credits

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